

## The Nature of and Behavioral Treatment of Sleep Problems in Youth with Bipolar Disorder

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### Abstract

Bipolar spectrum disorders (BP) occur in up to 1% of youth and are associated with significant impairment. Individuals with BP are often characterized by a decreased need for sleep or dysregulated sleep-wake schedules. For children, such sleep problems often relate to impairment in school and social functioning. Thus, sleep is an especially important target of intervention for youth with BP because of children's sensitivity to lack of sleep and dysregulated sleep routines. The present paper describes sleep-related issues in individuals with BP while also discussing potential behavioral interventions to improve sleep in youth with BP. Two case examples are presented to illustrate potential interventions.

Keywords: Bipolar spectrum disorders (BP), sleep-wake cycle.

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Bipolar spectrum disorders (BP) affect about 1-4% of the population and are chronic mood disorders characterized by fluctuating states of depression and mania often resulting in significant impairment (Kessler, Chiu, Demler, & Walters, 2005). BP may also be present in childhood or adolescence and subsequently affect social and school functioning. Prevalence estimates range from 0% (Costello, Angold, Burns, Stangl et al., 1996) to 1.2% (Shaffer, Fisher, Greenwald, & Greenberg, 2002) for bipolar I in youths, .1% to .6% for bipolar II (Costello, Angold, Burns, Erkanli et al., 1996; Kessler, Avenevoli, & Merikangas, 2001; Lewinsohn, Klein, & Seeley, 1995; Shaffer et al., 2002; Wittchen, Nelson, & Lachner, 1998), and .3% for bipolar NOS (Lewinsohn et al., 1995). The nature of symptoms in youth with BP disorder may differ somewhat from those seen in adults. For example, youth with BP are more likely to exhibit rapid cycling and mixed states of mania and depression (National Institute of Mental Health, 2001). Symptoms may be similar to the hyperactivity that is characteristic of attention deficit and hyperactivity disorder, oppositionality seen with other behavior problems such as oppositional defiant disorder, or irritability characteristic of childhood depression. However, one symptom that is characteristic of BP that distinguishes it from these other disorders of childhood is a decreased need for sleep (Kowatch, Youngstrom, Danielyan, & Findling, 2005) and dysregulated sleep-wake schedules (Faedda, Baldessarini, Glovinsky, & Austin, 2004). In fact, sleep and related characteristics have long been known to play an important role in mood disorders, especially BP (Rao, 2003). Thus, the purpose of this paper is to describe the importance of sleep for youth in general, and youth with BP, in particular. The paper also describes potential behavioral interventions to improve sleep in youth with BP, and concludes with two case examples that illustrate these techniques.

### *Relevance of Sleep for Child and Adolescent Functioning and Mood*

Sleep is important for regulating children's mood and behaviors and for maximizing attention and learning (Dahl, 1996; Mindell & Owens, 2003). In non-clinical samples, studies have shown that sleep problems are associated with behavioral and functional impairments. Indeed, one study with healthy children ages 7 to 12 found that quantity of sleep, especially low sleep time, was associated with teacher report of problem behaviors including attention and externalizing problems (Aronen, Paavonen, Fjallberg, Soininen, & Torronen, 2000). Irregularity in children's sleep-wake schedules are also related to poor teacher ratings of school functioning in fifth graders (Acebo & Carskadon, 1993). A large epidemiological study found that parent reports of their children's sleep problems were associated with their reports of internalizing and total problems, and with teacher reports of emotional, social, somatic,

attention, and delinquent problems (Paavonen, Solantaus, Almqvist, & Aronen, 2003). Youth with sleep problems were almost three times more likely to have clinically significant emotional problems. Similarly, sleep disruptions in adolescents have been shown to be linked with deficits in functioning including mood problems and suicidal ideation (Roberts, Roberts, & Chen, 2001).

### *Sleep and BP*

Studies with adults have documented that patterns in the sleep-wake cycle are related to mood symptoms associated with BP. One study found that adults with BP were more likely to have more variable circadian activity patterns than age and gender matched controls using actigraphic assessment (Jones, Hare, & Evershed, 2005). Not surprisingly, it has been proposed that a strong relationship exists between the systems that control sleep and affect (e.g., Dahl, 1996). Indeed, in adults, an association between sleep deprivation and the onset of manic episodes has been shown (Barbini, Bertelli, Columbo, & Smeraldi, 1996; Leibenluft, Albert, Rosenthal, & Wehr, 1996). Also, specific shifts in timing of sleep can affect mood (Wehr, Wirz-Justice, Goodwin, Duncan, & Gillin, 1979) and the body's circadian time keeping system (Boiven et al., 1996). In turn, disruptions in sleep, and change in the body's circadian time keeping system may affect regular routines and rhythms during the day. This further destabilizes the body's sleep-wake cycle, thus exacerbating mood difficulties (Ashman et al., 1999). Therefore, regularity of and duration of sleep cycle is importantly related to the clinical state of individuals with BP (Wehr et al., 1998). Further support of the importance of regulating sleep and circadian rhythms comes from investigations of Interpersonal and Social Rhythm Therapy (IPSRT; see Frank et al., 1994). IPSRT is based on the belief that stressful life events affect BP symptoms by disturbing the stability of sleep-wake habits, daily activity routines, and social stimulation patterns (i.e., social rhythms; Rothbaum & Astin, 2000). Thus, IPSRT helps BP patients' to regulate their social rhythms and to enhance coping when presented with stressors.

Unfortunately, there is a paucity of research on sleep in youth with BP. However, a few studies with youth with BP have found biological and qualitative differences from norms with regard to sleep. For example, research has shown that adolescents with latent BP have deficits in slow wave sleep (Rao et al., 2002). Moreover, a retrospective study of youth with BP found that almost half of the children had sleep disturbances that were most often characterized by insomnia and parasomnias, and that many of these symptoms were apparent by age 3 (Faedda et al., 2004). In a meta-analysis of seven studies describing symptoms of samples with pediatric BP, a range of 43% to 95% of the patients in each sample were found to have a decreased need for sleep (Kowatch et al., 2005). Sleep-wake cycles of youth with BP are often characterized by decreased alertness in the morning, increasing energy and mood intensity later in the day, and difficulty falling asleep at night (Mindell & Owens, 2003). Thus, although sleep is very important for all children to maintain health and maximize optimal behavior and learning, it is especially important for youth with BP given: (1) their predisposition to have sleep problems, (2) the need for regularity and predictability in their life to maintain a sleep-wake schedule and to help regulate mood and behavior, and (3) the heightened sensitivity to sleep changes and subsequent behavior and mood changes found in individuals with mood disorders.

### *Interventions Targeting Sleep in Youth with BP*

Given the important role of sleep in helping to regulate mood and behavior in children and adolescents, especially those with BP, sleep is an important target of intervention for youth with BP. In particular, it is important to normalize sleep-wake schedules and to target quantity, quality, and regularity of sleep in youth with BP (Ivanenko, Crabtree, & Gozal, 2004; Lewin, 2003). An important first step to identifying whether or not sleep problems exist is to have patients and/or parents (depending on age) complete a sleep diary to identify time of going to bed, time of sleep onset (after getting into bed), frequency and duration of night time awakenings, wake time, and frequency and duration of day time naps

(Sadeh, 2003; see Mindell & Owens, 2003 for an example of a sleep diary). This should be done for one week so that information is yielded for both the weekend and weekdays given changes in sleep patterns on the weekend (Carskadon, 2002). A clinical interview with parents and affected youth that asks about sleep history, routine before bedtime, sleep hygiene, and level of fatigue and energy is also important for an assessment of sleep difficulties. A mood diary is also recommended to accompany the sleep diary in order to recognize patterns among changes in mood and sleep.

In reviewing the sleep history and patterns of the patient, it is important to identify: (1) if there is an insufficient or excessive amount of sleep occurring, (2) if there is an excessive delay in sleep-onset (taking more than 20 minutes to fall asleep), (3) if there are multiple night awakenings with difficulty falling back asleep, (4) if the sleep schedule is reasonable (i.e., youth is going to bed at night and waking in the morning in time to commence expected activities such as school), (5) if sleep-wake schedule shifts dramatically on the weekends, and (6) whether or not other sleep hygiene factors are optimal. Optimal sleep hygiene includes having a regular sleep schedule involving the same sleep and wake times daily; avoiding caffeine, alcohol, and other substances; sleeping in a room that is cool, quiet, and comfortable; establishing a bedtime routine that is calm and sleep inducing; avoiding all stimulating activities at or close to bedtime, such as computer games and television; and using the bed only for sleep (Lewin, 2003; Mindell & Owens, 2003).

Given that it is common for youth with BP to have an irregular sleep-wake schedule, and a decreased need for sleep during manic phases, an important first step of intervention after the sleep assessment is to identify the correct amount of sleep required by the patient given his/her age and individual differences in needed sleep. The next step then is to establish a bed time that allows for a sufficient amount of sleep before having to wake in the morning. Children ages 3 to 5 typically require 11 to 12 hours per night, children ages 6 to 12 should get 10 to 11 hours per night, and adolescents should get 9 to 9½ hours of sleep per night (Mindell & Owens, 2003). Thus, as an example, an adolescent who needs to wake at 6:30 AM for school should ideally be in bed by 9:30 PM. There are certainly individual differences in the amount of sleep required, and youth with BP may say that they do not need the prescribed amount of sleep. However, given insufficient sleep is a risk factor for mania and for mood and behavior difficulties, it is important to increase the amount of sleep of youth with BP if they are not getting the developmentally appropriate amount of sleep, yet are displaying mood or behavior problems. At the very least, youth with BP who claim to need decreased sleep should have a set time to relax and “wind down” rather than engaging in stimulating activity prior to bed time. It is also important to regulate the sleep-wake cycle as much as possible. This includes maintaining the same bedtime and wake time daily and eliminating daytime napping. Schedules on the weekends should not stray more than approximately two hours from the designated sleep and wake times during the week.

Intervention may also be needed to decrease the time of sleep-onset to 20 minutes or less. Longer sleep onset may interfere with the normal sleep-wake cycle and may provide an opportunity to increase anxiety and mood difficulties if sleep onset is not attained relatively quickly. A first step would be to improve sleep hygiene related to behaviors prior to bed time and to the sleep environment. This may include removing caffeine in the evening, eliminating arousing activities within one hour prior to bedtime such as watching television, playing video games, doing homework, and talking on the phone; not doing anything in bed except for sleeping, not having a clock visible (so that anxiety does not increase when monitoring the time), and maintaining a consistent bedtime routine. This may be especially important for younger children and may include taking a bath, getting into pajamas, night time story, or other quiet time. It is also important to remove barriers to getting quality sleep such as drinking before bedtime (if it results in having to wake to go to the bathroom), noise, light, or distractions in the environment (if at all possible, youth with BP should have their own bedroom and should not have a television in their room), and distracting thoughts. Distracting thoughts may be diminished with the aid of activities such as writing

in a diary as part of a night time routine, getting organized for the next day, and completing homework that evening so that things are not left unfinished.

If, after these interventions, falling asleep does not happen in a timely manner, then the youth should get out of bed and do a trivial and boring activity. Examples may be folding clothes, reading a text book, or cleaning the room. Given that youth with BP have heightened sensitivity to arousal, such tasks should truly be boring and time-limited. Ideas of potential tasks to do in such an instance can be generated with the help of parents or therapist ahead of time. The patient should return to bed only when it becomes difficult to keep his/her eyes open. Lying awake in bed is not beneficial given that it reinforces that the bed is not a sleep-inducing environment. Thus, if possible, it is important for youth with BP to have separate space (e.g., desk, chair, soft rug on the floor) from their bed to engage in quiet activities.

Relaxation training may also be an important component to sleep interventions with youth with BP. Relaxation should be used prior to bed time in addition to times when the youth feels they need to regulate their mood. Relaxation can be taught in the form of deep breathing, progressive muscle relaxation, or guided imagery. It is best to take time with the patient reviewing the different methods and then, together, develop a relaxation routine from which the patient benefits. A relaxation tape should be made for the youth so that he/she can play it each night before bed.

Parents also play a very important role in behavioral treatment of youths' sleep difficulties. Psychoeducation of parents of youth with BP has been shown to be an effective psychosocial intervention for helping families manage and understand youth with BP (Fristad, Goldberg-Arnold, & Gavazzi, 2002). Thus, educating parents about the importance of sleep in regulating mood, providing rough guidelines for developmentally appropriate amounts of sleep, providing anticipatory guidance on potential sleep problems, and providing parents with skills to help regulate their children's emotions and circadian rhythms is an important way to involve parents. Parents should also be educated about the potential benefits of their modeling and reinforcing healthy sleep habits. Thus, maintaining appropriate sleep habits such as a consistent sleep-wake schedule and engaging in relaxing activities prior to bedtime are one way parents can help support their children's optimal sleep. Additionally, because youth with BP may be more sensitive to being aroused or emotionally dysregulated by stimulating activity or distracting noise, parents should be cognizant of the impact of the family's night time activity on the affected youth's ability to relax and regulate his/her behaviors. Thus, relaxation time prior to bedtime should be a habit of the entire family as much as possible. Additionally, if others are awake and engaged in activities after the affected youth is expected to be in bed, they should avoid making noises that would be distracting to the youth or that would entice him/her to leave the bedroom.

Parents also play an important role in reinforcing optimal sleep behaviors (Lewin, 2003). For younger children, this may be accomplished with a behavior chart whereby positive sleep habits such as complying with bedtime, maintaining a nightly routine and practicing relaxation are monitored and rewarded. Expectations for positive sleep habits should be explicit and noted on the sleep chart. The behaviors should be reinforced daily with sticker charts that are visible to the child. Larger weekly goals can be set and rewarded on the weekends. For example, 10 stickers could be rewarded by a trip to the ice cream store. Engaging in night time routines with the affected youth is also reinforcing. In other words, parents can make relaxation time an opportunity to provide some attention to the youth by reading a book, singing, or practicing relaxation techniques like deep breathing together. For adolescents, reinforcement may come in the form of extra privileges such as using the car or going shopping. Again, expectations for optimal sleep behaviors should be explicit and compliance with expectations should ideally be noted in writing on a daily basis. Teenagers with BP may be more oppositional and dysregulated in their sleep behavior than younger children, thus it may be more difficult to enforce a bedtime. However, adolescents should at least be expected to engage in relaxing activities in their room at the appropriate bedtime.

*Case Examples*

To illustrate these behavioral interventions, a case of an 8-year-old boy and a 16-year-old girl are described below. The eight-year-old boy, Ben, displayed symptoms such as severe mood dysregulation, irritability, increased energy and activity (without completion of tasks), decreased need for sleep, and poor social cognition. His parents reported consistent bedtime refusal. Struggles with his parents at night elicited increased conflict and irritability (for all involved) that further exacerbated his mood and sleep difficulties. This also took a significant toll on the family as they were trying to wind down while Ben was still energetic and frenzied at 9 PM. The intervention first involved determining an optimal bedtime for Ben. Given he needed to wake up at 6:30 AM and required about 10 hours of sleep for optimal functioning, it was determined that he should be asleep by 9:30 PM. His parents had been trying to enforce an 8:30 bedtime which was an unrealistic expectation for Ben. A plan was determined that involved bath at 8:30 PM followed by getting in pajamas, reading a story in his room with one parent, and practicing relaxation together which involved deep breathing and progressive muscle relaxation. Because he was often distracted by his older sister playing in her room next door, Ben's sister also had quiet time with the other parent at the same time in a separate room. Ben had a sleep chart with the following target behaviors: take bath and get into pajamas when instructed by parents, stay quietly in room after bath, and get into bed with lights out at 9:30. Each morning, Ben received a sticker on his sticker chart for each target behavior he complied with. If he got the target amount of stickers for the week (which increased each week if he was successful), then he got a predetermined reward usually in the form of an outing to shows, restaurants, or movies with his parents and/or friends on the weekend. After just 3 weeks, Ben was compliant and in bed by 9:30 most nights (about 80%) compared to almost no nights prior to the intervention. His parents also reported that interactions with Ben in the evening and morning were much more pleasant and less conflicted.

Tammy, a 16 year old, had difficulties falling asleep and with nighttime awakenings. She felt irritable and tired most days from the delayed sleep onset and frequent awakenings. Tammy reported that she had to get up by 7 AM and usually did not fall asleep until after 12:00 AM. She felt that, although she did not need a lot of sleep relative to same-aged peers, this was not enough sleep for her. It was determined that she should be getting at least 9 hours of sleep for optimal functioning. On review of her mood diary, it revealed that Tammy often fought with her mother at dinner time. Dinner with the family was mandated in Tammy's family, which was something Tammy did not enjoy. It often was a time that Tammy provoked conflict by bringing up issues such as asking for things from her parents or arguing about rules. When comparing the mood diary to her sleep diary, it was evident that she had more difficulty falling asleep when she was in a bad mood at night after fighting with her mother at dinner. Tammy also reported that she always kept a water bottle next to her bed and that drinking water was a habit and part of her night time routine. One step to the intervention was to work with the family to allow Tammy to be excused from the dinner table when they sensed she was agitated and unable to avoid conflict. Tammy's parents reported that they were aware of days when Tammy was more likely to start a fight and be unable to regulate her emotions. They agreed that it was best to let Tammy have time to herself during dinner when they sensed this was an issue. Tammy also agreed to stop drinking water after dinnertime and practiced relaxation strategies prior to going to bed. Finally, Tammy's parents were encouraged to praise her for spending quiet time in her room during dinner when she was emotionally aroused rather than be angry at her for disengaging from the family. Within two weeks, Tammy was no longer regularly getting up in the middle of the night to go to the bathroom and reported that she was able to fall asleep by 11 PM each night, which was a significant improvement. She also reported that she was less likely to be in a bad mood if she was not mandated to eat with the family each night and was subsequently better able to relax at night. Her parents also readily recognized her improvement and began to value the need to let Tammy disengage from the family when she was agitated and emotionally dysregulated. After a month, the family reported that, overall, Tammy's mood improved and she was more willing and able to participate in evening family activities.



### Conclusion

These case examples illustrate common sleep problems in youth with BP, and the impact that they can have on youth and their families. Sleep deprivation and disruption are significant problems in and of themselves, and play an important role in exacerbating mood disturbances among youth with BP. A thorough sleep assessment can inform the need for intervention to help regulate sleep. Potential behavioral interventions include psychoeducation, the development of consistent sleep and wake times and routines, relaxation procedures, and reinforcement for good sleep habits. By regulating sleep and maintaining consistent sleep-wake schedules, potential mood disturbances can be prevented and/or minimized.

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